

REMARKS

The Office Action dated April 23, 2003 been reviewed and carefully considered. Claims 1-6 remain pending in this application, of which claims 1 and 4 are the independent claims. Reconsideration in view of the following remarks is respectfully requested.

The abstract was objected to for phraseology, and has been amended in a manner that is believed to overcome the basis for objection.

Claims 1-6 were rejected under 35 U.S.C. 102(e) as anticipated by U.S. Patent No. 6,118,823 to Carr.

Claim 1 recites “A video encoder for predictively encoding images with reference to one reference image in a first (P) prediction mode and to two reference images in a second (B) prediction mode, comprising a motion estimation circuit using a first interval of a frame encoding period in the second (B) prediction mode to search motion vectors representing motion between an input image and one of said two reference images, and using a second interval of said frame encoding period to search motion vectors representing motion between said input image and the other one of said two reference images; characterized in that the motion estimation circuit is arranged to use the first interval of the frame encoding period in the first (P) prediction mode to search motion vectors representing motion between an input image and said one reference image, and to use the second interval of said frame encoding period to refine the motion vectors found in the first interval.”

Inventive aspects of the apparatus are discussed at least in the specification (e.g. page 5, lines 6-8).

Although the Carr reference discloses refinement, during both the IPB mode (col. 13, line 20) and the IP modes (col. 14, line 15), of found motion vectors (col. 13, line 46: “Each search result is first refined . . . full pixel . . . half pixel”; col. 14, lines 22 and 33-34: “A motion estimation on full pel is first performed” and “Half pel refinement is performed by a process similar to the process used in IPB coding”), Carr fails to disclose or suggest that forward and backward motion vectors are B-mode searched in separate intervals, much less the “first interval” and the “second interval” as explicitly recited in the invention of claim 1. Moreover, Carr fails to disclose or suggest P-mode searching of motion vectors in “the first interval” and refinement of the motion vectors in “said second interval” as specifically recited in the invention of claim 1. For at least these reasons, Carr fails to anticipate or render obvious the invention as recited in claim 1.

As to claim 3, it also recites the above limitations, and is likewise deemed to be patentable over the cited reference.

The remaining claims each depend from either base claim, 1 or 3, and are patentable for at least the same reasons as their respective base claim.